

What is claimed is:

1 ~~1.~~ /37 A method of establishing communications between a base station and a
 2 system controller over a network, comprising:
 3 ^{SGSN} identifying a plurality of paths in the network, each path defined by an
 4 address in the base station and an address in the system controller; and
 5 selecting one of the plurality of paths to communicate data associated with
 6 a given mobile station.

1 ^{F811} ~~2.~~ /38 The method of claim 1, wherein selecting one of the plurality of paths
 2 comprises performing an implicit negotiation in which the path is defined by a source
 3 address of a message communicated by the base station and by a source address of a
 4 message communicated by the system controller.

1 ~~3.~~ The method of claim 2, wherein performing the implicit negotiation
 2 comprises sending and receiving messages in a session having bi-directional data flow.

1 ~~4.~~ /39 The method of claim 1, wherein the network is a packet-switched, ^{F820}
 2 connectionless network, and wherein selecting one of the plurality of paths comprises
 3 selecting one of a plurality of virtual connections on the packet-switched, connectionless
 4 network, each virtual connection based on a base station address and a system controller
 5 address.

1 ^{F812} ~~5.~~ /40 The method of claim 1, further comprising selecting another path by
 2 sending a message from another source address.

1 ~~6.~~ The method of claim 5, wherein sending the message comprises sending a
 2 UNITDATA message.

1 ^{F817} ~~7.~~ /41 The method of claim 1, further comprising selecting another path by
 2 sending a change-route request.

1 8. The method of claim 7, wherein sending the change-route request
2 comprises sending a General Packet Radio Service NS-CHANGEROUTE request.

1 9. The method of claim 7, wherein selecting another path by sending the
2 change-route request is part of an explicit path negotiation.

1 10. The method of claim 7, wherein selecting another path by sending a
2 change-route request is performed during a session having unidirectional data flow
3 between the base station and the system controller.

1 11. The method of claim 7, wherein sending the change-route request
2 comprises sending a request containing an identifier of a mobile station.

1 12. The method of claim 11, wherein the identifier comprises a General
2 Packet Radio Service temporary logical link identifier. *TC*,

1 13. The method of claim 7, wherein sending the change-route request
2 comprises sending the change-route request using a new source address, and wherein
3 selecting the other path is based on the new source address.

1 14. The method of claim 1, further comprising: *Fig 15*
2 disabling an address; and
3 sending a change-route request containing the disabled address to change a
4 path for each mobile station assigned a path defined by the disabled address.

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1 15. A first system for use in a mobile communications network, comprising:
2 a communications module adapted to communicate over a packet-
3 switched network coupled to a second system, the first system being one of a base station
4 and a system controller and the second system being another one of the base station and
5 the system controller;
6 a storage element containing one or more first addresses associated with
7 the first system; and
8 a control module adapted to select one of plural paths over the packet-
9 switched network, each path defined by one address associated with the first system and
10 one address associated with (the node.)

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1 16. The first system of claim 15, wherein the communications module is
2 adapted to communicate over a Gb interface provided in the packet-switched network.

1 17. The first system of claim 15, comprising the base station.

1 18. The first system of claim 15, comprising the system controller, the system
2 controller comprising a serving GPRS support node. SGSN

1 19. The first system of claim 15, wherein each path comprises a virtual
2 connection.

1 20. The first system of claim 15, wherein each address comprises an Internet
2 Protocol address.

1 21. The first system of claim 15, wherein each path is further defined by a
2 User Datagram Protocol port of the first system and a User Datagram Protocol port of the
3 second system.

1 22. The first system of claim 15, wherein the control module comprises a load
2 sharing task to select different paths for different mobile stations.

1 23. The first system of claim 15, further comprising a GPRS Network Service
 2 layer, the Network Service layer comprising the control module.

1 24. The first system of claim 23, further comprising an upper layer, the
 2 Network
 3 Service layer exchanging primitives with the upper layer.

1 25. The first system of claim 24, wherein the primitives comprise an NS-
 2 UNITDATA-Request primitive carrying outbound data and an NS-UNITDATA-
 3 Indication primitive carrying inbound data, the NS-UNITDATA-Indication primitive
 4 containing a remote link selector parameter, and the NS-UNITDATA-Request primitive
 5 containing the remote link selector parameter and a local link selector parameter.

1 26. The first system of claim 25, wherein the control module is adapted to
 2 select an address associated with the first system based on the local link selector
 3 parameter. *LSP*

1 27. The first system of claim 26, wherein the control module is adapted to
 2 select an address associated with the second system based on the remote link selector
 3 parameter. *RSP*

1 28. An article comprising at least one storage medium containing instructions
 2 for recovering communications over a network between a system controller and a base
 3 station, the instructions when executed causing a first node to:

4 disable an address in the first node, the first node being one of the base
 5 station and the system controller; and

6 redirect subsequent data from the first node to a primary address of a peer
 7 node, the peer node being the other one of the base station and the system controller.

1 29. The article of claim 28, wherein the instructions when executed cause the
 2 first node to communicate data over a packet-switched, connectionless network.

1 30, A method for load sharing between communication ports on an originating
2 device and a destination device where the communication link is an Internet Protocol-
3 based communication link, comprising:

4 receiving a first message from an originating device on a communication
5 port of a destination device, the communication port identified by an original Internet
6 Protocol address;

7 determining which communication port on the destination device to use
8 for subsequent messages in response to receiving the first message, the communication
9 port to be used for subsequent messages identified by a new Internet Protocol address;

10 transmitting a change-route message from the destination device to the
11 originating device, the change-route message specifying the new Internet Protocol
12 address for messages transmitted from the originating device to the destination device.

1 31. The method of claim 30, further comprising:

2 receiving the change-route message at the originating device; and
3 changing a destination Internet Protocol address to the new Internet
4 Protocol address for subsequent messages transmitted from the originating device to the
5 destination device.

1 32. The method of claim 30, wherein the originating device is a base station
2 and the destination device is a serving GPRS (Global Packet Radio Service) support
3 node.

1 33. The method of claim 30, wherein the originating device is a serving GPRS
2 (Global Packet Radio Service) support node and the destination device is a base station.

1 34. The method of claim 30, further comprising transmitting subsequent
2 messages from the originating device to the new Internet Protocol address on the
3 destination device.

1 35. The method of claim 30, wherein load sharing is performed on a per
2 mobile station basis.

1 36. A data signal embodied in a carrier wave comprising instructions for
2 performing implicit load sharing in a network between nodes in a wireless
3 communications network, the instructions when executed causing a first node to:
4 receive a signal from a mobile station;
5 select a first address of one or more first node addresses to use for
6 servicing the mobile station;
7 transmit a message containing the signal from the first node to a primary
8 address of a second node;
9 receive another message from the second node, the other message sent
10 from a second address associated with the second node; and
11 select a path based on the first and second addresses.

1 37. An article comprising at least one storage medium containing instructions
2 for establishing communications between a base station and a system controller, the
3 instructions when executed causing a first node to:
4 identify a plurality of paths in the network, each path defined by an
5 address in the base station and an address in the system controller, the first node being
6 one of the base station and system controller; and
7 select one of the plurality of paths to communicate data associated with a
8 given mobile station.

1 38. The article of claim 37, wherein the instructions when executed cause the
2 first node to:
3 select one of the plurality of paths by performing an implicit negotiation in
4 which the path is defined by a source address of a message communicated by the base
5 station and by a source address of a message communicated by the system controller.

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1 39. The article of claim 37, wherein the network is a packet-switched,
2 connectionless network, and wherein the instructions when executed cause the first node
3 to select one of the plurality of paths by selecting one of a plurality of virtual connections
4 on the packet-switched, connectionless network, each virtual connection based on a base
5 station address and a system controller address.

1 40. The article of claim 37, wherein the instructions when executed cause the
2 first node to further select another path by sending a message from another source
3 address.

1 41. The article of claim 37, wherein the instructions when executed cause the
2 first node to further select another path by sending a change-route request.

1 42. The article of claim 41, wherein the instructions when executed cause the
2 first node to send the change-route request containing an identifier of a mobile station.

1 43. The article of claim 42, wherein the instructions when executed cause the
2 first node to send the change-route request using a new source address, and to select the
3 other path is based on the new source address.

1 44. The article of claim 37, wherein the instructions when executed cause the
2 first node to further:
3 disable an address; and
4 send a change-route request containing the disabled address to change a
5 path for each mobile station assigned a path defined by the disabled address.